

LESSON 1 SYSTEM OVERVIEW

This lesson outlines the tasks and the scope of responsibilities of a CHPS System Manager.

This lesson provides information on the hardware and applications in CHPS.

By the end of this lesson, you should be able to:

- List the purposes of CHPS servers 1/2/3, 4/5/6, and 7/8/9.
- List the hardware comprising CHPS.
- List the software used in CHPS.
- Differentiate between the Operator Client (OC) and the Stand Alone (SA) instance.
- Describe the purposes of the interfaces available to view databases and troubleshoot CHPS.

1.2 SYSTEM MANAGER OVERVIEW

CHPS has several applications to help manage the system. Using the tools in CHPS provides System Managers with information on the health of the hardware and software components.

System Manager Responsibilities

As you will discover while taking the course, CHPS System Managers have various tasks, including, but not limited to:

- Creating CHPS user accounts
- Monitoring the health of the hardware and software components of CHPS
- Setting up data input/output
- Rebuilding configurations and local datastores
- Optimizing the hardware and software for more efficient data processing

Since the responsibilities of RFCs vary, ask the management team at your local or regional office for guidance on the specific tasks you are required to perform. Whether your office takes a team approach to managing CHPS, or you ARE the CHPS System Manager, try using a log, either paper or electronic, to track the changes made to your system.

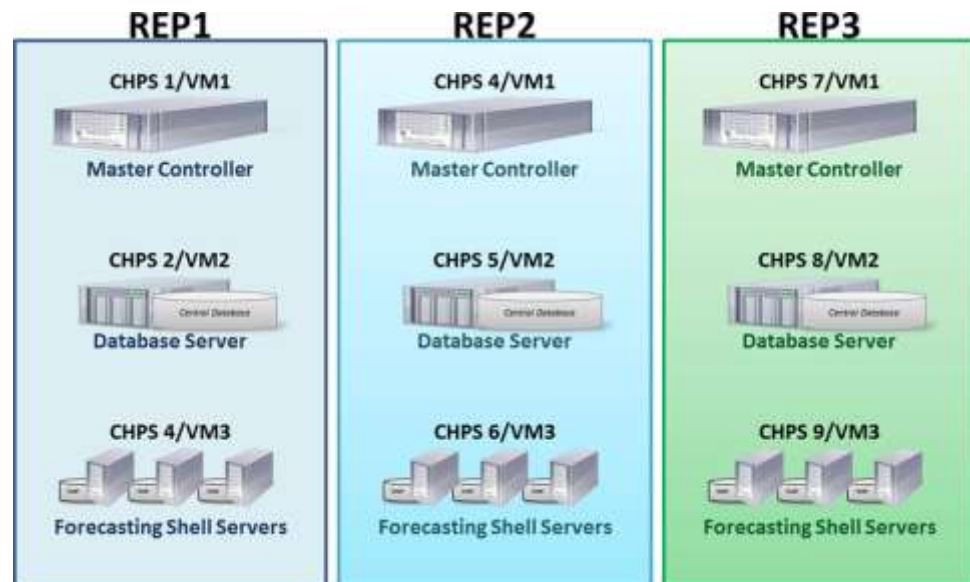
Program Management Hint: Whether working alone or with a team, creating a log will help you recall what changes have been made to the hardware and software in your office's CHPS.

1.3 SYSTEM ARCHITECTURE

You must know the basic components of the system in your role as a CHPS System Manager. This knowledge allows you to more easily identify the source of problems and resolve problems quicker.

Three servers, called River Ensemble Processors (REPs), perform the functions of CHPS. The servers are designated as REP1, REP2, and REP3.

Each REP houses three **virtual servers**. The virtual servers (or virtual machines) are designated always referred to as VM1, 2, or 3, regardless of which physical server it resides.



1.4 CHPS SOFTWARE

Much of the CHPS system runs Java software. The presentation below describes the role of each piece of Java software.

Advantages - CHPS uses commercial off-the-shelf (COTS) software rather than NWS-developed software. The software installed in CHPS is consistent among offices, and additional support is available online. By knowing what software is used in CHPS and how it functions, System Managers can more easily identify the source of problems and resolve them quicker. Much of the CHPS system runs Java software. This makes it easy for the applications to not only communicate with the server, but also with each other.

JBoss - is the application server. It provides infrastructure for JMS. Since it is a Java-based server, it functions well when deploying and communicating with the rest of the Java software in CHPS.

JDBC – The Java Database Connectivity (JDBC) driver allows Java programs to access database management systems connected to it (how DbVis accesses FirebirdSQL and PostgresQL databases).

JMS – The Java Messaging System (JMS) is a messaging service used in CHPS to transfer information from JBoss (CHPS1) to the Master Controller. It also connects the Master Controller to the FSS and the MC to the OC.

JRE – The Java Runtime Environment (JRE) software executes all of the Java programs. CHPS uses Java Runtime Standard Edition.

MCProxy is an application on each FSS that acts as an interface for the FSS can...

- accept task dispatch requests from the MC
- start a Forecasting Shell Server to honor the request
- respond to queries from the MC on the status of the FSS

Tomcat – Apache Tomcat software, running on a web server, builds the Administration Interface.

1.5 OC/SA COMPARISON

Slide Text

CHPS: A Tale of Two Modes; OC vs. SA

Two Modes

The two modes were created to enable RFCs to test and validate changes to the CHPS system without affecting the operational system.

The operational version is called the Operator Client or OC.

The Stand Alone (SA) is the test bed version of the system.

Operator Client

The OC communicates with the Master Controller, passing data back and forth with the Central Database.

Each forecaster has an individual instance of the OC with a local datastore.

Stand Alone

The Stand Alone system for CHPS can be thought of as an “all-in-one”.

Use the SA to make changes to the CHPS settings to test them. This way, operations will not be interrupted by the changes.

Each user with an OC account has the ability to use CHPS in SA mode.

Unlike the OC, the SA is NOT connected to the Master Controller.

Instead, the SA runs off a local datastore and file system.

Each user with an OC account has the ability to use CHPS in SA mode.

1.6 SYSTEM MANAGER TOOLS

System Manager Tools

As a System Manager, it is your responsibility to maintain CHPS. The system has several tools to help with this task.

Administration Interface - Web-based tool for monitoring system health. See Lesson 3 for more information.

DbVisualizer – Database management tool that uses SQL to locate databases and query data. See Lesson 5 for more information.

System Monitor – Display information on system status. The OC version has more tabs than the SA. See the Deltares wiki for more information.

Configuration Manager – Allows the System Manager to load validated configuration files to the OC. See Lesson 2 more information.

Database Viewer – Display the local datastore while CHPS is connected to the database (located in the IFD).

LESSON 2 GETTING STARTED

One of the first steps in managing CHPS is creating accounts for forecasters, and learning some basic system management techniques.

This lesson provides the CHPS System Manager with instructions on the fundamentals of creating user accounts and the basics of system management tools.

By the end of this lesson, you should be able to:

- Create an Operator Client account.
- Create a Stand Alone account.
- Control access to CHPS.
- Locate and use the Configuration Manager.
- Rebuild a Forecasting Shell Server (FSS) local datastore.

2.2 CREATE CHPS USER ACCOUNTS

This section provides information on setting up user accounts in CHPS.

Each forecaster must have two accounts in order to use CHPS. One account accesses the Stand Alone, the other for the Operator Client.

As System Manager, you must have a user “fews” account in addition to the two user accounts (described above) in order to perform some of the system management tasks.

You also need to have an account for the Administration Interface. We will talk about those accounts in [Lesson 3](#).

New forecasters need an AWIPS account before obtaining CHPS accounts.

2.3 ACCOUNT SPECIFICS

After establishing a user "fews" account for yourself, you can create accounts on the Stand Alone and the Operator Client for new forecasters.

Stand Alone

Accounts on the Stand Alone system provide the perfect way of testing new configurations or software without affecting the operational system.

People who need Stand Alone accounts:

- New forecasters who need some "spin-up" time
- Experienced forecasters honing forecast skills or using hindcasting mode to prepare case studies
- CHPS Configuration Focal Points testing new configurations

Only one instance of CHPS, as user "fews", can run at a time, so establishing individual accounts allows multiple people to run CHPS in SA mode at the same time.

For guidance on setting up a standalone instance of CHPS, refer to the job sheet below.

Operator Client

In order to send forecast information, an Operator Client instance of CHPS needs to be established.

Contact the AWIPS System Administrator to set up an AWIPS account for the forecaster. Then, create a directory (for example, [/awips/chps_share/userid](#)) for the forecaster to host all of the CHPS-specific information.

Use the following job sheet to set up a Stand Alone account.

Job Sheet: [Creating a CHPS SA Account](#)

2.4 PERMISSIONS

Granting access to water regulatory agencies and academia to RFC information increases collaboration and more accurate and timely forecasts. After all, the “C” in CHPS stands for “Community”.

Setting up permissions and user groups is **optional**, but allows cooperating agencies (i.e., WFOs and the Corps of Engineers) to remotely access CHPS, but limits them to certain functions within the system.

Example: Agencies outside the NWS can experiment with what-if scenarios.

The Corp of Engineers could see if increased reservoir release would cause stages to exceed thresholds downstream.

However, the scenarios do not affect official forecasts, and tasks such as approving forecasts remain invisible to the agency.

Coordinate! The CHPS System Manager and management team will probably deal with the request for access, but the CHPS Configuration Focal Point will edit the **Permissions.xml** and **UserGroups.xml** files to determine who sees what aspects of the CHPS IFD.

For information on setting permissions, please see the Deltares wiki.

Reference: [Permission Configuration \(Deltares\)](#)

2.5 PERMISSIONS EXAMPLE

“C” for Community – Using CHPS to cooperate with other agencies

Setting up user groups and permissions allow cooperative agencies access to CHPS.

Granting access allows agencies to run what-if scenarios and judge impacts on other sites.

Let’s look at how cooperation without access to CHPS would usually work.

In the following example, Maggie is a forecast at an RFC.

Justin works in the water control division of another federal agency.

Standard Agency Interaction

River Forecast Center, this is Maggie.

Hi Maggie, this is Justin with water control. We are thinking about releasing 50,000 cfs from the Bourdain Reservoir. What do you think that’s going to downstream at Alton? We have a dredging barge there, and if the flow is too high, we have to cease operations.

Standard Agency Interaction

Too bad Justin did not realize the forecast for the segment containing the Bourdain Reservoir was sent a few minutes ago and only had releases at 20,000 cfs.

So now **everyone** has a problem.

Maggie has to rerun the forecast.

The outflow from her forecast group has changed, so other forecaster have to rerun forecasts.

Justin has a forecast he cannot use.

Other users of the forecast now have an outdated product and they probably will not return to your website for a new forecast until tomorrow.

Agency Using CHPS

If Justin had access to CHPS, he and his team could have run what-if scenarios for various releases.

Then the team could have discussed how much water to release without jeopardizing the project downstream.

Let’s see what happens if we grant permission to the other agency...

Agency Using CHPS

River Forecast Center, this is Maggie.

Hi Maggie, this is Justin with water control. I’m calling to let you know we ran through some what-if scenarios and decided to release 30,000 cfs from Bourdain today. We’ll probably keep the releases at 30,000 for the rest of the week.

Justin, I will go ahead and change the releases in the model to 30,000 for the rest of the week and send the forecast. It should be out within the hours.

Thanks again for calling.

Using the what-if scenarios, the team was able to make informed decisions about releasing water from the reservoir.

Not only did the agency benefit, but Maggie was able to incorporate the right amount of water in the forecast.

Other users will benefit because they will be getting a more accurate forecast.

2.6 CONFIGURATION MANAGER

Recall from [CHPS Basic Configuration training](#) one of the benefits of CHPS is virtually everything is configurable. While this could lead to numerous configuration sets, the Configuration Manager is here to help!

The Configuration Manager is a tool within CHPS to manage the upload of validated configurations to the live system. In addition to allowing the CHPS System Manager to upload new configurations, the application helps with version management by using optional descriptions when uploading files.

Program Management Hint: Although the description is optional, include it! Descriptions are more helpful than just a date of the configuration upload in the event your office has to roll back to a previous configuration.

In addition to using the Configuration Manager when uploading validated configurations, use it when CHPS runs do not complete, the system exhibits irregular behavior, or does not run at all. First, you must determine whether the configuration is “bad” or “corrupt”.

Symptom	“Bad” or Corrupt?	Cause	Solution
CHPS runs are not completing.	Bad	A typo or other small error in the configuration file.	Roll back to a good configuration, use the SA to fix mistakes, and upload the corrected configuration using the Configuration Manager.
Irregular CHPS behavior or CHPS does not run at all.	Corrupt	More widespread problems with configuration files.	Use the MCR recovery Tool to remove the old configuration and load a new one. Note: Use this only if uploading corrections to the configuration is not practical.

After opening the Configuration Manager, you may notice some file names in the center of the screen are highlighted. This indicates which files comprise the active configuration.

For more information about using the Configuration Manager, or how to use the MCR recovery Tool, please see the job sheets and references below.

Job Sheets: [Using the Configuration Manager](#) | [Completing Configuration Rebuild](#)

2.7 FSS REBUILD

The Forecasting Shell Servers (FSSs) host data import and export, and execute model runs.

Example: The user accounts are set up, the new configuration is in place, but workflows are still not completing. What is happening?

Workflows not completing is a common symptom of a Forecasting Shell Server local datastore issue.

Potential causes include:

- accrual of too much data in the local datastore (i.e., running ESP 15 times a day),
- not regularly running the FSS Rolling Barrel,
- corruption in the data, and/or
- installation of a new build or patch.

The causes vary, but the fix is the same - rebuild the FSS local datastore in order to restore complete functionality.

Rebuilding the FSS local datastore requires access to password-protected areas of the system and the ability to stop and start FSS processes.

Remember, if multiple people are managing CHPS, good communication is essential to keep the components functioning to support the mission of your River Forecast Center!

Use the job sheet below for instructions on how to rebuild an FSS local datastore.

Job Sheet: [Rebuilding the FSS Local Datastore](#)

LESSON 3 ADMINISTRATION INTERFACE

The Administration Interface is a "snapshot" of your office's CHPS system, and is a great monitoring tool.

This lesson provides information on performing system maintenance tasks using the Administration Interface.

By the end of this lesson, you should be able to:

- List several uses for the Administration Interface.
- Create user accounts for the Administration Interface.
- Determine CHPS system status.
- Locate log files.
- Determine the status of data import into CHPS.
- Schedule and cancel forecast tasks.
- Map workflows.
- Map Event Actions.

3.2 PURPOSE OF ADMIN INTERFACE

Many servers, applications, and configuration files comprise CHPS. System Managers use the Administration Interface (also referred to as the Admin Interface, or AI) to provide a health status snapshot of CHPS in one location.

Monitoring

The Admin Interface is a web-based tool with a separate IP address for each Master Controller (MC). This interface locates the MCs through their IP address, so a separate Admin Interface is configured for each MC.

Using the Admin Interface as a monitoring tool is not required, but it can be a helpful place to look when the system is experiencing problems, or to monitor for issues when installing a new build or patch.

For instance, the System Manager section can determine which software is not loading properly and on which server.

Mapping Workflows

In addition to monitoring, you can use the Admin Interface to map workflows to FSSs, and complete the setup of Event Actions.

The following sections in this lesson provide additional information on the functionality of the Admin Interface, including monitoring of servers and data feeds, and the monitoring and scheduling of tasks.

Stop now and use the procedure on the job sheet to begin navigating the basic functions of the Admin Interface.

Job Sheet: [Accessing the Administration Interface](#)

3.3 ACCESS TO AI

All AWIPS users can access the Admin Interface. The Admin Interface was set up during the initial release of CHPS. For initial access to the system, submit a FogBugz ticket. See [Lesson 6, Reporting](#), for more information on FogBugz.

So who needs access? CHPS System Managers definitely need access, but so does everyone who uses CHPS. The information from this interface helps people create more descriptive trouble tickets than, “It does not work”.

Example: Weekend or evening shift forecasters (who are not configuration or system focal points) can use the Admin Interface to determine why data is not being imported correctly; WFOs did not receive forecasts, or various other issues.

Reminder: Accounts are needed for **each** of the Master Controllers in your RFC’s CHPS system. Therefore, if your office has three Master Controllers, you need to establish three accounts per user.

Take a few minutes now and use the job sheet below to practice creating, modifying, and deleting Admin Interface accounts.

Job Sheet: [Managing Admin Interface User Accounts](#)

3.4 SYSTEM STATUS

The Administration Interface System Status Menu Tour

System Status provides a health snapshot for the Forecasting Shell Servers and the Master Controllers (NTP: might need to change this email Brad to find out about multiple MCs) in CHPS.

System Status is the default Admin Interface view.

You can return to this display by clicking the **Live System Status** link.

While you are looking at the following information from the presentation...keep the following in mind...

All items in the Admin Interface are color coded.

Green – okay/Yellow – unknown/Red – failed

Let us take a look at the interface from the top down. You get an idea of:

- which tasks are running or in the queue to run
- the status of the Forecasting Shell Servers
- the status of the remote Master Controller
- the health of the modules on the Master Controller
- how many operator client sessions are active
- the size of the log table
- what version of the Master Controller (NTP: fix in media piece) software is being used
- and the status of services such as Pi-Service (NTP: fix in media piece) and the Java Messaging Service

Let's return to the System Status menu and take a look at the next item, **Active Services**.

MC ID – Access a table of active services and sort them by the Master Controller on which it is running.

User ID - Locate the user ID of the Operator Client. This is helpful to determine whether it is operator error or occurring with multiple users.

OC Address – The address of the Operator Client. This is helpful in determining whether it could be a machine error.

Login Time – This lists what time the user logged into the system.

PID – This is the process ID, which is helpful if you have to kill a “hung” process.

Description – This column contains a description of the active service.

3.5 LOG FILES

The System Status provides an overall view of the system. For more in-depth information on a problem, check the log files.

Click the tabs to learn more about what information is available by accessing the log files through the Admin Interface.

For more information and specific instructions on managing log files, please see the job sheet below.

Job Sheet: [Viewing/Downloading/Managing/Saving Log Files](#)

View Logs

Click View Logs link to bring up the View Logs interface. The same color-coding used on the rest of the interface is used for this table. Use the sort and filter options to locate a specific error or error type. At the top of the interface is a Download logs link.

Hint: Use the download option to save log files when experiencing CHPS problems and attach pertinent files to FogBugz trouble tickets.

Narrow down log entries using the Filter Log Message feature.

Log Manager

Below the View Logs section is the Log Manager. Use this interface to purge log entries by date or the severity of the error. If you utilize the purge by “date” option, be aware the system deletes all entries prior to the indicated day.

Log Collector

The Log Collector option creates a directory with the contents of the MC/FSS home directories. The entries are put into a zip file containing SystemReport.log, ScheduledTasks.xml, and AdminInterfaceLogs (a directory with .log files from Tomcat).

3.6 DATA FILES

Data comes in from various sources and is the backbone of CHPS. Should you set up new data sources or run into a data issue, the Admin Interface can help you track data.

On the left side of the Admin Interface is a link labeled “Files”. The **Files** link provides information about data coming into CHPS.

Use the **Files** section to monitor data in the system and information on what is not making it into CHPS. The table shows which MC was used, the directory of the data, when it was imported, what was imported, how many files the system read, and possibly most importantly, how many files failed.

Hint: Identify the most severe problems by sorting by the column headings.

The **Files** option has subcategories for failed imports, dumpfiles, import status, and successful imports. Use these submenus for sorting entries based on what information you are trying to find.

After determining which files were not imported successfully, you can take action such as navigating to the data directories and looking for irregularities with the files.

The Files Menu You can use the Administration Interface to discover which files are importing correctly and which fail.
Import Status Click Import Status to bring up the status of all import-related entries. System Managers can monitor information coming into CHPS.
Successful Imports Click this link to view only successful imports. This is a good place to check to see if new data sources import correctly.
Failed Imports Click Failed Imports to troubleshoot data feed issues.
Dump Files Click Dump Files to navigate to the directory where the zip archive of FSS module directories are copied after a failed run.
Summary The Admin Interface provides CHPS System Managers with a quick way of identifying a problem. The Admin Interface is also an excellent tool to use for monitoring the CHPS system and preventing errors.

3.7 FORECAST TASKS

One of the most useful features in the Admin Interface is the **Tasks** section. The Admin Interface allows System Managers to schedule forecast tasks, manage existing tasks, and monitor running tasks. **Example:** Completing a forecast task (such as doing ESP runs) is taking much longer than usual. Use the “Forecast Tasks” section of Admin Interface to determine which tasks are running or scheduled to run.

The Admin Interface has a link in the left menu for this option, called “Forecast Tasks”. The section also has the submenus “Scheduled Tasks” and “Running Tasks”.

Scheduled Tasks - This section lists the tasks scheduled to run. The tasks are organized into a table with information about what the task is, when it runs, and the status. This table also shows suspended and finished tasks. The last column on the right gives action options for managing each task. Use this interface to rerunning a forecast task, temporarily stop a forecast task, or resume paused (or “suspended”) tasks.

Caveat: Scheduling tasks, such as UpdateStates, cannot be easily added using the Admin Interface because each warm state interval **must** be added. Create these in the IFD “Manual Forecast” tab instead.

Above the table of tasks are a few additional options. Use the:

- **Schedule New Task** link to create a new forecast task
- **Upload Task(s) from File** option to import the tasks listed in a file and schedule them to run
- **Download All Scheduled Tasks** link to download an XML file with all the tasks currently scheduled on the MC

Caution! It is easy to inadvertently cancel or resume a scheduled task (UpdateStates, data imports, ESP runs, etc.).

Running Tasks - The Running Tasks submenu opens a table showing all tasks dispatched and currently executing in CHPS. The tasks are listed by MC, ID, Workflow ID, Time, FSS ID, and status. You can also use these column headings to sort the tasks. The last column is the actions column. The only action available in this table is to “kill” (halt) the executing task.

Caution! Killing a job may bring down a forecasting shell!

For more detailed instructions on scheduling, suspending, and resuming tasks, please see the job sheet below.

Job Sheet: [Scheduling Forecast Tasks](#)

3.8 MANAGING WORKFLOWS AND FSSS

Another function of the Admin Interface is managing workflows and FSSs. The Admin Interface allows users to view all of the current workflows, map workflows to FSSs, and add new FSSs.

Although you may specify which FSS should run a task, selecting the “All” option gives the task to the FSS with the shortest queue.

The Admin Interface error logs indicate which workflows completed and which ones failed, and where the mapping for workflows is done.

Unless a workflow is mapped, it will not execute!

The “Workflows and FSSs” link in the left menu has a few submenus also. The “Workflows” menu displays the currently mapped workflows and version information for each.

The “Workflow and FSS Mapping” submenu displays mappings between a workflow and the FSS with which it is associated. Each of these entries also comes with the option to edit or delete the workflow. Above the table is a link to an interface allowing System Managers to create new Workflow FSS Mappings.

The “Forecasting Shell Server” submenu is where System Managers register new FSSs to the MC.

Reminder: Each MC has a unique URL. So if you are adding an FSS to each MC cluster, make sure you are logging into each MC and registering the corresponding FSS.

While exploring this section, you will also see submenus for Event Action Configuration and Event Mapping. The next page discusses these topics in more details.

Hint: Delete and rebuild the OC local datastores every few days so the datastore does not get too large. However, do not perform this procedure on the FSSs unless there is a problem.

For guidance with mapping workflows and managing FSS resources, use the following job sheet.

Job Sheet: [Editing and Mapping Workflows](#)

3.9 EVENT ACTION MAPPING

What are event actions? Event actions are workflows triggered when a threshold is crossed. Event actions are triggered after another event concludes.

Example: The completion of one workflow could trigger the running of another workflow such as the export of a time series or the export of a report.

The Admin Interface section, “Workflows and FSSs”, has a submenu for Event and Action Configuration and Event Action Mappings. From the Configuration link, CHPS System Managers can view existing configurations and upload new ones. The Event Action Mappings submenu allows System Managers to map actions to system events.

However, Event Actions require configuration changes in addition to the mappings done in Admin Interface.

Example: An agency may issue one forecast every six hours. However, once the flow or stage reaches a certain level (action stage), CHPS can automatically issue more frequent forecasts if event actions are defined and mapped.

The following job sheet outlines the procedure to map an Event Action workflow.

Job Sheet: [Event Mapping](#)

3.10 SYSTEM CONTROL

System Managers may need to switch primary MCs in order to perform maintenance or troubleshooting tasks. The Admin Interface provides System Managers an easy method for switching MCs and selecting MC priorities.

The last menu on the left side of the Admin Interface page is “System Control”. Clicking this link opens the MC Failed Status and System Startup/Shutdown information.

MC Failed Status

Whether installing updates to the main MC or if an issue arises, failover is the best method to switch MCs. See [Lesson 4, Failover](#), for more information on the causes and procedures for Failover. For now, simply note the location of this menu.

Master Controller Failover Priorities

Under the “System Control” link is only one submenu. The “Master Controller Failover Priorities” link allows System Managers to select which MC to failover to in systems with more than two MCs. We discuss this topic in Lesson 4.

System Startup/Shutdown: Startup and Shutdown cannot be completed through the Admin Interface. You can use another method to shutdown and restart the CHPS system and processes.

Use the job sheet below to complete the procedure.

Job Sheet: [Shutting Down/Starting Up CHPS Hardware and Processes](#)

LESSON 4 HANDLING DATA

As a System Manager, you are responsible for making sure data comes into CHPS and forecasts are transmitted.

This lesson provides a description of the CHPS data path and information on how to perform routine maintenance to keep CHPS functional.

By the end of this lesson, you should be able to:

- Locate important directories and log files.
- Set up data inputs to CHPS.
- Discuss the consequences of adding data and methods for reallocating memory.
- Troubleshoot input errors.
- Use Pi-Service to send data to WFOs.
- Synchronize servers, server clusters, and datastores.
- Initiate the failover process.

4.2 DIRECTORY STRUCTURE

You must be able to navigate this directory in order to set up new inputs, configure outputs, and locate log files.

Note: The information to the left is only an example. YOUR RFC may have slight variations in the file structure of your system.

chps_data Import Directory

Data is imported to the chps_data import directory from various sources including cooperating agencies.

The file types are generally ASCII, SHEF, GRIB, and XML files but could also be other formats.

The main types of input include IHFSDB, OFS, MPE, and Pre-Processed data. A script separates each data type into directories on the CHPS data servers.

The chps_data import directory is separated by type of data or source of data.

chps_data Output Directory

CHPS sends out several types of data, including:

- RFC Forecasts - Sent to WFOs in XML format.
- Updated Model States - Sent to WFO HydroBase as an XML file.
- Data for hindcasting or training - Stored in CHPS system as various file types.

The last output type is used in CHPS Simulations. For more information on how to configure your system for simulations, please visit the [CHPS Simulation Configuration Training](#).

Note: Keep in mind that bringing in new data and creating data to send out requires memory. We discuss memory allocation later in this lesson.

4.3 INPUT SETUP

Data coming into CHPS should already be configured; however, you must still complete setup when new data sources become available.

Consider the following scenario: One of your local WFOs calls and explains the state has put in new gages at a wildlife refuge. The state is sending the data directly to the LDAD in CSV format.

System Manager Actions:

1. Create a new import directory on the Stand Alone and FSS.
2. Write a script (placed outside the import directory) to pull the data from the LDAD into AWIPS.
3. Schedule the script to run on the cron.
4. Edit the Configuration File/Map Workflow in AI.
5. Open an instance of CHPS Stand Alone.
6. Upload the configuration and test on the FSS and OC.

It is important to note data input into CHPS varies from office to office.

4.4 MEMORY ALLOCATION

When establishing new input data (or when working with data in general) it is important to consider memory. Recall that every time an object is created, memory is used. To avoid running out of space, you must allocate memory to each area.

Memory Management

CHPS runs on a Java platform and uses a Java script called "garbage collector" to free up memory.

The two types of memory in the system are Heap and PermGen (where the system stores metadata). This course deals with Heap.

Heap is where all objects get their memory.

As System Manager, you must configure the CHPS system to avoid memory loss. The default for Heap is 64 MB. Use caution when changing the default value. If Heap is too big, there could be a memory leak. If it is too small, the system might rob other areas of memory to operate. Memory allocation can be configured on the FSSs, MC, and OC.

Typical Memory Settings

Server	Processes	Allocation
MC	FSListener, OCLListener, Synchronization	512 MB
MC	Task Manager, RemoteProxy, SystemMonitor	64 - 128 MB
FSS	MCPProxy	64 MB
FSS	FewsShell	512 -1024 MB

The memory value for the Operator Client is highly variable, based on RFC. Ask other RFCs what setting works best for them and use that as a guideline.

Note: If OCLListener/FSListener or FSS requires more than 1024 MB, look for unnecessary large files before increasing memory size.

For instructions on changing memory settings or optimizing the OC and FSS through memory allocation, refer to the job sheet.

Job Sheet: [Checking/Changing Memory Settings](#)

4.5 INPUT ERRORS

Once you set up a new data source, you need to ensure the data made it to the CHPS Interactive Forecast Display (IFD).

Data sources include:

- Satellite Broadcast Network (SBN)
- LDAD
- manually imported data
- AWIPS Wide-Area Network (WAN)
- local input

Scripts sort the data into the data directories. At the end of the process, all data ends up on the FSSs (CHPS 3/6/9) in individual directories. You will need to check each step in the process if you receive a data error message.

Data Error Messages

At times, CHPS may open without the most recent data. Here is an example of an error message: NTP: put in a non-photo example

Checking for Data Input Errors

It is best to work your way backwards towards the source of your data when checking for an error. If you make it through each leg of the process without discovering an error, it could be an issue with your data source.

Example: You notice data coming from LDAD is not updated in the data directories. Working backwards, here are the recommended steps you would take.

- Check if data made it past the AWIPS firewall.
- Check if data made it to LDAD.
- See if LDAD is running.
- Check LDAD for primary server processes.
- Contact the Network Control Facility (NCF).

4.6 PI-SERVICE

The NWSTC recommends Pi-Service application for extracting data from FEWS.

FEWS Pi-Service
Once you have data coming in, the forecasters can complete a forecast for each basin in the area (Make this HSA?).
About Pi-Service
Now it is time to send the forecast to the WFOs.
The NWST recommends using FEWS Pi-Service to extract the forecast data from FEWS.
The forecasts are extracted as XML strings.
To modify the script, called <code>fews_piservice.sh</code> , some Java and/or Python programming knowledge is required.
Find the Pi-Service configuration files in one of two locations:
Main application path (chps3) <code>/awips/chps_local/pi_services</code>
OC configuration path <code>/awips/chps_share/oc/<user>/xxrfc_oc/Config/PiServiceConfigFiles</code>
Each Forecasting Shell server also has separate files.
When setting up Pi-Service, the configuration files must go in the <code>PIServiceConfigFiles</code> directory.
Pi-Service Troubleshooting
The status page on the Admin Interface will show if the application is running properly.
Using the command line is a second method for verifying the application. Type: <code>ps -ef grep fewspi</code>
If Pi-Service is not running, start the application just like you would JBoss or the MCPProxy. Use the job sheet at the bottom of the page for detailed instructions.
If you still cannot identify the problem, work with the Configuration Focal Point to check settings and ports in the configuration files.
Note: The SA and OC are the same, but the FSS ports are different.
If Pi-Service appears to be working correctly, check the application (such as <code>gxsets</code>) Pi-Service uses to send the data to the WFO.

Take a few minutes and review the procedures on the job sheets to start Pi-Service, or troubleshoot if there are issues.

Job Sheets: [Start Pi-Service](#) | [Troubleshoot Pi-Service](#)

Reference: [Fews Pi-Service](#) (Deltares)

4.7 SYNCHING

Recall from Lesson 1 CHPS has three server clusters to allow for testing, development, and backup. You can synchronize many aspects of the CHPS system. Setting up the correct synching tasks prevents performing actions on multiple servers and provides a backup should a server go down.

CHPS Synchronization
Definitions: <ul style="list-style-type: none">• Primary Client Servers: The operational CHPS system at an office. Typically, CHPS 1/2/3 are the Primary Client Servers.• Secondary Client Servers: The servers used on an as-needed basis when the primary system is not available. Typically, CHPS 4/5/6 are the Secondary Client Servers.• MC: Master Controller• OC: Operator Client• FSS: Forecasting Shell Server
Note: The terms “synchronization” and “synch” are used interchangeably.
Synch levels are an integer that tells the system how often to synch. For example, “4” is used for infrequently synched data, such as climate or astronomical data.
Importance of Synching - Synching optimizes the dataflow and backs up the Primary Client Servers. All system with primary and secondary servers should be synched.
Synching processes occur between MCs, the MC and FSSs, and the MC and OC.
Server Setup - The first two steps, setting up Primary and Secondary client servers, should be complete at all RFCs.
The third step is specifying the remote MC in the <code>fews.master.mc.conf</code> file. This information may just be commented out in the file.
Now, schedule MC-MC synch tasks, called “MC_Synchronisation” workflows, for each MC using the Admin Interface.
Finally, click the “run on failover” box associated with the task. This way, the secondary MC detects the failure of the primary MC and will start running the task. Only schedule tasks on the MC where it should run in order for the failover capability to work! Note, the backup MC is NOT a copy of the primary MC.
The second type of synching is MC-FSS synching.
Each time a forecast task runs, the FSS synchs, runs the task, and then synchs the task back to the MC. MC - FSS synching is different than MC - MC synching. When the FSS starts, it automatically synchs.
A synch profile is an XML file, found in every FSS directory, containing all of the items to be synched and the synch levels. Tasks are mapped to a workflow using the Admin Interface.
The next type is MC-OC synching. Like the FSS, OC synch tasks are defined in <code>synchProfiles.xml</code> . File location: <code>/awips/chps_share/oc/<user>/xxrfc_oc</code>
Another configuration step is needed. You must define the OC to which the MC synch in the <code>oc_synchConfig.xml</code> file.
Like the FSS, when you start the OC, the local datastores synch. Synching ensures each local datastore has the more up-to-date data.
CHPS has several different local datastores. The FSS's is a nearly complete version of the Central Database. The OC and SA versions are not. The amount of data in OC and SA local datastores is a configurable option in <code>synchProfiles.xml</code> .
Many different types of synching makes sure data is shared in CHPS. Making sure data is synched appropriately for how it is used with help keep CHPS running more efficiently.

4.8 FAILOVER

If a component is corrupted in the main server cluster, or if it is time to install the latest build, failover is the best method to switch to another Master Controller. Failover is the process of switching from your primary server cluster to your backup system.

Failover happens when the primary system needs brought down or fails, and the backup system takes over all properly scheduled tasks. The secondary system is NOT a copy of the primary. Common reasons for failover include:

- rebuilding FSS on MC00
- installing software on MC00 (best to do on back-up servers first, then run off of those while installing on MC00)
- rebuilding the configuration on MC00
- crash of any major component on MC00

Reminder: Failover only works if you have scheduled all of your required tasks and synching correctly and follow failover procedures. Go through your list of tasks and make sure to check the failover box on required tasks.

The basic steps in failover include using the Administration Interface to set the MC status to fail and then restoring the MC status the same way.

For specific instructions, please see the job sheets below.

Job Sheets: [MC Failover](#) | [MC Restore](#)

LESSON 5 DBVIS

As a System Manager you need to monitor and maintain the many databases of CHPS.

This lesson provides instructions on how to use DbVis, commercial software used to connect to datastores.

By the end of this lesson, you should be able to:

- Describe and locate the DbVis product.
- Identify the functions of the DbVis product.
- Review SQL/PSQL basics.
- Describe the connection of DbVis to the Central Database.
- Establish a connection between DbVis and FSS local datastores.
- Use DbVis to connect to OC/SA datastores.

5.2 ABOUT DBVIS

One of the most useful tools in the System Manager's arsenal is DbVisualizer. Using this program can save time and effort.

DbVisualizer (DbVis) is a Java-based database management tool created by the DbVis software company. Information on all of their products is available at the [DbVis web site](#).

The NWS uses DbVisualizer Free, a version with database management features and an SQL command window. This package is included with the CHPS installation and, if not already installed, is located in the original CHPS installation directory.

DbVis Functions

System Managers use DbVis to access data tables comprising CHPS. DbVis functions include database queries, editing databases or information, and moving data.

One of the most efficient features of the tool is the access to all the databases in the CHPS system with the one program.

Note: Any user can open DbVis; however, to access the databases, you need a username and password.

5.3 GETTING STARTED

Recall, CHPS uses two types of database management software, [Firebird SQL](#) and [PostgreSQL](#).

The Central Databases are PostgreSQL databases, housed on CHPS 2, 5, and 8. All other databases including the FSS, and the OC and SA local datastores are FirebirdSQL.

Locate Directories - Before connecting DbVis to any databases, locate all Firebird local datastores directories on the OC, SA and FSS. Connecting to the PostgreSQL databases is easy because the DbVis software comes pre-packaged with a Java Database Connectivity (JDBC) driver to make the connection.

Connect to Databases - Connecting to the Firebird databases require a couple of extra steps.

Note: In order to set up a database connection, you must launch DbVis from the *correct server*.

The same is true for accessing an OC or SA local datastore. In addition, you must shut down the OC or SA before accessing its datastore.

Example: Launch DbVis from CHPS 3 to connect to a FSS database located on CHPS3.

5.4 CENTRAL DATABASE

The Central Database is large; however, you can quickly set up a connection in DbVis to simplify database management. The Central Database, which is PostgreSQL, requires a driver to connect to DbVis. The driver, called JDBC, is included with the original installation package.

The file connecting the JDBC driver to DbVis is located at the following path:

[/awips/chps_share/DbVisualizer-6.5.1/jdbc/postgresql/postgresql.jar](#)

Since the software is configured to use this type of database, the directory structure and files are already in place. Should the files disappear, a replacement **postgresql.jar** file is required in the directory in order to connect to the Central Database. Use the job sheet below to establish a Central Database connection.

Job Sheet: [Connecting to the Central Database](#)

Reference: [DbVisualizer Website](#)

5.5 FSS DATASTORES

Not only are there numerous Firebird databases on the Forecasting Shell Servers (FSS), the syntax used in FirebirdSQL commands are slightly different from PSQL and SQL. With only a couple extra steps, DbVis connects you to all of the FSS databases.

CHPS 3/6/9 each contain multiple FSSs.

Every FSS has a Firebird local datastore.

You can query the databases using commands in a terminal window, but using DbVis is simpler.

DbVis was not installed with a Firebird database driver, so there are a few extra steps in the setup.

Overview of Steps to Configure DbVis to Connect to Firebird Databases:

1. Create Firebird driver directory.
2. Copy binary files into the Firebird directory.
3. Copy binary files into the DbVis lib directory.
4. Create launch script.
5. Open DbVis and manually set up the connection.

Note: For information on rebuilding the local datastore on FSSs, see [Lesson 2, FSS Rebuild](#).

For detailed instructions on connecting DbVis to FSS Firebird databases, see the job sheet below.

Job Sheet: [Connect DbVis to Firebird Database](#)

5.6 OC/SA DATASTORES

Like the FSS local datastores, the databases on the OC and SA are also Firebird. These databases can be connected to DbVis with a couple quick steps.

The setup is similar and requires navigating to the SA or OC directory on an AWIPS workstation, then connecting to the local datastore.

Remember: You must run the script from the AWIPS machine to launch DbVis and set up the connection to the OC or SA local datastore. In addition, you must stop the OC or SA to connect. You must exit DbVis to launch the OC and SA again.

See the instructions below for details on how to connect DbVis to an OC or SA local datastore.

Job Sheet: [Connecting DbVis to an OC or SA Firebird Database](#)

5.7 BASIC DBVIS FUNCTIONS

DbVis has several menus to help if you prefer to navigate DbVis without using SQL.

- The **File Menu** contains options for loading SQL statements, saving current statements, and porting DbVisualizer settings. Note: Use the Export and Import Settings options to save your preferred DbVisualizer settings.
- The **Edit Menu** provides general edit and a few SQL edit options.
- The **View Menu** provides navigation functions for different windows in DbVis.
- The **Database Menu** creates connections, connects or reconnects to databases, and changes the view in the object tree. Note: You must click the **Connections** link at the top of the object tree (and click next to all the databases you want to use) to use the **Connect All** function.
- The **SQL Menu** controls the SQL window and associated menus.
- The **Bookmarks Menu** allows you to save frequently used SQL statements and SQL bookmarks.
- The **Tools Menu** provides options for connections to a new database, setting up drivers, or monitoring certain SQL statements.
- The **Window Menu** provides options for viewing the functions of DbVis.
- The **Help Menu** connects to resources on DbVis functions. Note: An Internet connection is required for connecting to the Users Guide and Online Resources options.

Note: Save the DbVis settings in a .jar file. go to the **File** menu, click **Export Settings**, and specify the name and file location. Use the new settings for other DbVis sessions by selecting **Import Settings** from the **File** menu and choosing the .jar file.

5.8 SQL REVIEW

The databases in CHPS are either PostgreSQL or FirebirdSQL. Both types of database management software are extensions of the SQL language.

DbVis is equipped with an SQL Command feature. Recall the basics of SQL language and you can query the database to find data quickly.

Examples of the basic commands are **SELECT**, **FROM**, **ORDER BY**, **AND**, **WHERE**, etc. Notice the SQL commands are English words, not code. Some commands have dire consequences when used incorrectly.

Example: The phrase DROP TABLE, permanently deletes your table if entered into the SQL Command prompt. While there may be a time where you want to delete a table or database (though not common), this is a good example of how important it is to know the function of each word.

Here are a couple common queries useful in DbVis:

Query	Example
Select * (then put your table name);	Ex. SELECT * from TimeSeries;
Select * from fews.00.timeseries where <information here>;	Ex. SELECT * from fews00.timeseries where moduleinstance='name';

References: [Basic SQL Course](#), [Another Basic SQL Course](#), and the developer's website, dbvis.com.

5.9 OTHER METHODS OF DATABASE MANAGEMENT

If you are having difficulty connecting to DbVis, there are alternative methods for searching databases. The NWSTC recommends, however, connecting using DbVis.

pgAdmin3

The program, pgAdmin3, is a database management GUI similar to DbVis. It can only be used with PostgreSQL databases.

pgAdmin3 requires knowledge of the PSQL language. This is a useful tool, but many of the CHPS databases are Firebird and best viewed in DbVis.

Command Line Queries

While **not** recommended, you also have the option to skip the GUIs and go back to command line queries. As with the DbVis SQL Command window, certain words or phrases could mean the end of a database. Each database type requires a different syntax. In addition, each database type requires a username and password.

Here are the basic steps to using command line to query a database.

1. Log onto the server hosting the database
2. Log into the database
3. Enter the password
4. Use correct syntax to query the database

Example: To enter the Central Database, you must start up the database from CHPS 2 using the command "psql -l". You are prompted for a password.

[SQL](#), [PostgreSQL](#), and [FirebirdSQL](#) have some different syntax uses and shortcuts. While interactive terminal version of PSQL and SQL do function with many similar commands, there are shortcuts built in and version specific options to review.

Reference: [pgAdmin Developer Website](#)

LESSON 6 TROUBLESHOOTING

An understanding of general troubleshooting techniques will help you zero in on the cause of CHPS problems.

This lesson provides a high-level overview of troubleshooting techniques. For information on specific problems, use the resources listed in this lesson.

By the end of this lesson, you should be able to:

- Describe procedures used in general troubleshooting.
- Identify techniques used in CHPS troubleshooting.
- List types of errors.
- Troubleshoot common CHPS issues.
- Use CHPS tools to solve CHPS issues.
- Report problems on FogBugz and chps_ops.

6.2 DEFINITION

Troubleshooting is a **logical** and **systematic** search for the source of a problem. By logical, we mean it generally works through a documented process of elimination.

Following steps helps ensure you approach all problems with clear logic, eliminating more common errors before beginning more complex investigations.

Work smarter, not harder!

This becomes even more critical when we consider there are many complex relationships between the user, the computer, the program, and the servers, AND multiple failures and causes are possible.

6.3 TECHNIQUES

This page identifies three techniques, which may assist you before and during troubleshooting.

Technique 1: Maintenance

As a CHPS System Manager, you should perform regular maintenance including:

- Reading release notes associated with each install to be familiar with software changes.
- Ensuring no specific user has unneeded or illegal files.
- Cleaning up the system by removing obsolete or unnecessary files and obsolete entries from the system.

Everything begins with maintenance.

Technique 2: Communication Strategy

The second critical area is communications.

If more than one person in your office performs any of the regular maintenance listed above, be sure to work out a plan to document and communicate when changes occur in the system.

Documenting system changes are also useful if you work alone. You might not always be able to recall your latest change when you are troubleshooting.

This type of preparation may significantly shorten the time spent troubleshooting and correcting errors.

Technique 3: Working from Common to Rare Possibilities

After identifying and isolating the issue, begin diagnosing the situation.

Start with the most probable and common issue, and progress to the least probable and uncommon issue.

Hint: Other users may have already experienced the problem you are seeing. Check the chps_ops list and FogBugz for posting of known issues.

6.4 MAINTENANCE AND MONITORING

One of the best ways to prevent issues is monitoring and maintaining CHPS. System Managers should routinely check a few key areas to prevent common issues.

Maintenance Hint:

If more than one person will be involved in routine maintenance, coordinate with the team and come up with a list of items to check and a schedule of when to check them. This prevents duplicating efforts or missing an item on the list.

The presentation below outlines some common maintenance tasks that should be part of every System Manager's routine.

What	How
System Status	Frequently check System Status to catch issues quickly. Do not forget about the back-up systems!
Workflows	Monitor workflows and specifically check items such as Rolling Barrel, import tasks, and synching times on all servers.
Error Messages	Monitoring the log files in AI, the CHPS IFD, and System Monitor.
local datastores	Manage the size of OC local datastores when needed to optimize performance.
Running Processes	Use command line syntax to check running processes such as the Master Controller, JBoss, Tomcat, and MCPxies.

Reference: [Troubleshooting, Monitoring and Maintenance presentation](#) (Deltares wiki)

6.5 TYPES OF ERRORS

Here are some tips for handling the various types of errors discussed on the previous page.

General Hint: Check for solutions on the FogBugz wiki or subscribe to the chps_ops infolist. If you encounter an error not mentioned on the infolist, start a new thread.

User Errors

Again, when working with computers, the most common and probable issue generally is a user error. Indicators of user errors include, but are NOT limited to:

- system changes not taking effect
- missing files or changes

Sometimes, putting a file in the wrong directory causes the error. Make sure to verify where new files belong in the directory structure by consulting documentation.

Machine Errors

Machine failures are easy to discover because an error occurs on only one workstation. All of the other workstations are functioning properly. Try recreating the issue on multiple workstations.

- If all others are working correctly, the problem is most likely related to the machine.
- **Reminder:** Use the SA to perform the operations before using in OC mode.

Server and Program Errors

Like most software, CHPS is updated periodically, and some of the updates introduce software bugs occasionally.

Use the back-up system or the development servers (7/8/9) to test the latest install to avoid errors on the main servers. If no errors are present, move on to the remaining servers.

Note: Software installs are typically schedule-driven rather than on-demand, so offices may have to deal with issues caused by a software bug for days or even weeks.

6.6 PROCEDURE

Remember, everything begins with [maintenance](#) (click here for a checklist).

<p>Step 1 Identify the Problem</p> <p>Avoid jumping to conclusions. Ask questions. The first step in troubleshooting is typically to identify or describe a problem. Ask questions like:</p> <ul style="list-style-type: none">• What is the problem?• What are the symptoms or indicators?• Can the problem be recreated?• Is it a known issue?	<p>Step 2 Isolate the Issues</p> <p>The next step is to isolate the issue. In this step, use the following questions to isolate the issue:</p> <ul style="list-style-type: none">• When did the problem begin?• Were there any changes to the system recently?• Do you see any warning or error messages?• Do the log files indicate any specific errors?
<p>Step 3 Gather Data</p> <p>After identifying an issue, continue to use a logical and systematic approach to diagnose the situation.</p> <ul style="list-style-type: none">• Look up the issue in the help menu.• Use the job aides from the course or refer to the Deltares Delft-FEWS Configuration Guide.• Research for known issues.• Network and discuss the issue with your colleagues.	<p>Step 4 Take Action</p> <p>After you determine a course of action, be sure to:</p> <ul style="list-style-type: none">• Document the steps you take (optional, but very helpful).• Restart the application if needed.• Share what you learned with others.

6.7 COMMON PROBLEMS

As a System Manager, a forecaster will come to you for help troubleshooting an issue. Often, the same problem will arise more than once. CHPS has built-in tools to help you diagnose the problem. Please refer to previous sections for more information on these topics. Here is a quick rundown of the tools available and their capabilities.

In your role as CHPS System Manager, you will likely encounter the following problems. Use this as a reference when performing troubleshooting at your office. If the first item on the list does not work, continue working through the numbered items.

Problem	Application	Action
System Status not displaying correctly	Admin Interface	<ol style="list-style-type: none">1. Stop and start the instance.2. Reload the instance.
Process status "offline"	Admin Interface	<ol style="list-style-type: none">1. Stop and restart CHPS.2. See FogBugz ticket 536.
Rolling Barrel is very slow or not completing	Admin Interface	<ol style="list-style-type: none">1. Ensure the Rolling Barrel processes are staggered.2. See FogBugz ticket 709.
Workflows are not completing	Admin Interface, Workflow Navigator	<ol style="list-style-type: none">1. Look for a log entry corresponding to the failed process (AI).2. Ensure the workflow is mapped (AI).3. Make sure the workflow is on the Workflow Navigator list.4. Ensure the workflow is registered in the proper configuration file.
The OC or SA will not open	AWIPS terminal window	<ol style="list-style-type: none">1. Log out of CHPS and log back in.2. Rename the current local datastore, then rebuild a fresh one.
Forecast runs not completing successfully	Configuration Manager	<ol style="list-style-type: none">1. Locate the corrupt configuration in the CM and edit the files.
Data in the IFD is outdated	Database Viewer	<ol style="list-style-type: none">1. Did the forecaster advance the system time in the IFD?2. Check the model run time in Database Viewer.
Suspected "bad" configuration	System Monitor, Configuration Manager	<ol style="list-style-type: none">1. Identify configuration problems in the System Monitor.2. Correct the configuration issues in CM.

Printable Reference: [Common Problems](#)

6.8 RESOURCES

If you encounter an issue you do not know how to solve, there are a couple of places to check for documentation. If you still cannot find a solution, it is time to report the problem.

Deltares Wiki - On previous pages, this course has referred you to the Deltares wiki for more information. The wiki contains information about common issues, recommended procedures, CHPS training, and documentation on the various components of the CHPS system.

Remember: Deltares creates software used worldwide. To search the most relevant NWS documentation, make sure to log into the Deltares Wiki.

CHPS_Ops Listserv - The chps_ops listserv is a commonly used platform for CHPS operation issues. Sign up for the listserv in order to log on and browse the messages or opt-in to receive emails each time a new topic is posted. This is an excellent resource for troubleshooting because another RFC may have encountered the same problem **and** documented a solution.

Go to the listserv web site, locate the [chps_ops listserv](#), and click subscribe. You will receive a confirmation email once your membership has been accepted.

6.9 REPORTING

You located the problem in the system, checked resources for a solution, but could not find one. Now what do you do? Report the problem on FogBugz.

FogBugz - FogBugz is a bug tracking system built by Fog Creek Software. You can learn more about the company at their website, fogcreek.com.

FogBugz provides a platform to report problems and receive consistent feedback with headquarters and other RFCs.

You can also browse the cases to see if another RFC had a similar problem.

This could save you time and provide quick solutions to issues. The FogBugz site also has links to OHD-created materials.

For more information on how to report a problem using FogBugz, use the instructions in the job sheet below.

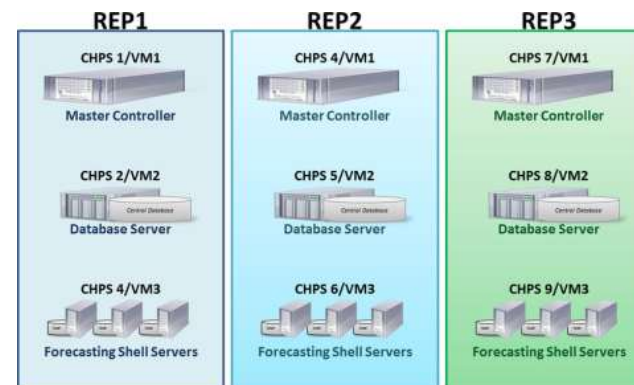
Job Sheet: [Reporting Problems on FogBugz](#)

COURSE SUMMARY

System Overview

CHPS uses Java software to carry out CHPS functions on three physical servers, each housing three virtual servers.

- CHPS 1/4/7 delegate tasks, monitors the system, and relays messages
- CHPS 2/5/8 host the Central Database
- CHPS 3/6/9 house the FSSs, which execute model runs and schedule tasks
- The SA is ideal for training and testing because it is NOT connected to the Central Database.
- CHPS contains several interfaces to interact with the databases and troubleshoot the system, including the Admin Interface, DbVisualizer, System Monitor, Configuration Manager, and the Workflow Navigator.



Getting Started

You must...

- Create directories with correct permissions for new forecasters to have both a Stand Alone and an Operator Client instance of CHPS.
- Work with the AWIPS System Administrator to obtain an AWIPS account for new forecasters.
- Coordinate with the CHPS Configuration focal point and the management team at your office to set permissions for cooperating agencies to access your CHPS system.
- Rebuilding the FSS local datastore is necessary to keep the FSS servers fully functional.

Admin Interface

- The Admin Interface (AI) is a web-based tool for monitoring the CHPS hardware.
- A separate instance of AI is needed for each Master Controller in your office's system.

Task	AI Menu	Submenu	Purpose
Add a new user account	User Administration	Add User	Users can check the health of the system and if needed, provide specific information in FogBugz tickets.
Schedule tasks	Forecast Tasks	Scheduled Tasks	Staggering the times tasks runs helps the FSSs run more efficiently.
View/manage log files	System Status	View Logs	Log files provide a more in-depth perspective on problems with the system.
Map workflows	Workflows and FSSs	Workflow FSS Mappings	If the workflows are not registered, they will not run!
Map Event Actions	Workflows and FSSs	Workflow FSS Mappings	Trigger an action, such as sending a forecast automatically, when a threshold is exceeded.
Monitor CHPS system health	System Status	N/A	A "snapshot" view of the health of hardware and modules in CHPS.

Handling Data

- When new data sources become available, use the data setup steps in this lesson.
- Use the suggested settings to allocate memory for the most efficient operation of the system.
- If data from a new source is not making it into the system, see if LDAD is running or if the data even made it to LDAD.
- Modify the **fews_piservice.sh** script in order to use the recommended way of sending forecast data to WFOs.
- Use the job sheet in this lesson to synchronize servers, server clusters, and data stores to prevent execution of redundant tasks and in the event a server goes down, provide backup.
- If server clusters become corrupted, use AI to failover the Master Controller.

DbVis

DbVis is a Java-based database management tool. You must launch DbVis from the server where the database is located. DbVis functions include querying databases, editing databases or table entries, and moving data.

Connection to...	Database Type	Needed to Connect
Central Database	PostgreSQL	Drivers delivered with initial CHPS installation.
FSS local datastore	Firebird	Create a few directories (no driver delivered).
OC/SA local datastore	Firebird	Run a setup script from an AWIPS terminal window.

See the job sheets in Lesson 5 for specific instructions on completing these tasks. Some helpful SQL commands include SELECT, FROM, ORDER BY, AND, and WHERE.

Troubleshooting

- The four steps in troubleshooting are: **identify** the problem, **isolate** the issues, **gather** data, and **take action**.
- Some helpful techniques include regular maintenance, communicating with others, and working from common to rare possibilities to identify problems.
- You will typically deal with user, machine, and software errors.
- CHPS has applications to assist in troubleshooting, including the Admin Interface, the Workflow Navigator, and DbVis.
- If problems persist even after performing troubleshooting steps and utilizing resources, such as listservs, write a detailed FogBugz ticket.